

CLAIMS

What is claimed is:

1. A process for determining an impact location of a transmitter-bearing object within a geographical area containing a target, wherein the process comprises the steps of:

A. providing an object with a transmitter which upon activation transmits a unique signal, wherein the transmitter includes a non-synchronized time/frame counter to indicate a length of time during which the signal is transmitted;

B. providing at least three stations for receiving data contained in the signal transmitted from the object and then transferring the data to a central processing station; and

C. providing means at the central processing station to use the data in performing calculations to determine the impact location of the object.

2. A process as defined by Claim 1, wherein the process comprises the additional steps of:

D. placing the receiving stations in a triangular configuration having an area which creates a spatial plane that geographically includes the target;

E. determining the linear distances between the receiving stations and the central processing station;

F. defining the spatial plane by a coordinate system to perform the calculations at the central processing station, whereby the spatial plane is correlated to the geographical plane of the target range by an algorithm; and

G. determining correction factors which are used to adjust for signal delays in transferring data from the receiving stations to the central processing station, whereby the correction factors are based upon the differences in linear distances between the receiving stations and the central processing station.

3. A process as defined by Claim 1 wherein the transmitter-bearing object is a projectile, bomb, free-falling bomb, laser-guided missile, smart bomb, infrared-guided missile, practice bomb, tank or other military or non-military vehicle.

4. A process as defined by Claim 3 wherein the transmitter-bearing object is a bomb.

5. A process as defined by Claim 3 wherein the transmitter-bearing object is a practice bomb.

6. A process as defined by Claim 1 wherein the target is a physical or non-physical thing.

7. A process as defined by Claim 1 wherein the target is an enemy ship, munitions storehouse, personnel location; communications facility or a set of grid coordinates.

8. A process as defined by Claim 7 wherein the target is a set of grid coordinates.

9. A process as defined by Claim 1 wherein the receiving stations create a spatial plane which does not include the target.

10. A process as defined by Claim 1 wherein the calculations performed at the central processing station are performed using the following mathematical formula:

$$\cos^{-1}\left(\frac{(x+t_2)^2 + (x+t_1)^2 - D_3^2}{2 \times (x+t_2) \times (x+t_1)}\right) + \cos^{-1}\left(\frac{x^2 + (x+t_2)^2 - D_2^2}{2 \times (x+t_2) \times x}\right) + \cos^{-1}\left(\frac{(x+t_1)^2 + x^2 - D_1^2}{2 \times (x+t_1) \times x}\right) = 360$$

wherein X is the unknown amount of time required for the signal upon impact of the transmitter-bearing object to reach the closest receiving station, the receipt of the signal serving to activate the counters at each receiving station; t_1 is the amount of time in addition to X required for the signal upon impact of the transmitter-bearing

object to reach the next closest receiving station; t_2 is the amount of time in addition to X required for the signal upon impact of the transmitter-bearing object to reach the farthest receiving station; D_1 is the distance between the first and second receiving stations; D_2 is the distance between the first and third receiving stations; and D_3 is the distance between the second and third receiving stations.

11. A process as defined by Claim 10 wherein D_1 , D_2 and D_3 are constant values.

12. A process as defined by Claim 1 wherein the impact locations of a plurality of transmitter-bearing objects can be determined.

13. A process as defined by Claim 1 wherein the signal ceases upon impact of the transmitter-bearing object.

14. A process as defined by Claim 1 wherein the signal continues after impact of the transmitter-bearing object.

15. A process as defined by Claim 1 wherein there is no impact of the transmitter-bearing object.